

ELEMENTS OF CONSTRUCT IN THE NEW LOWER SECONDARY CURRICULUM

1st The learner appreciates the contribution of chemistry to our economy

- a) Manufacture of oxygen gas
- b) Manufacture of chlorine gas
- c) Extraction of metals – Na, Al, Cu, Zn, Fe
- d) Manufacture of fertilizers
- e) Manufacture of cement
- f) Manufacture of sodium hydroxide
- g) Manufacture of sulphuric acid
- h) Manufacture of ethanol
- i) Manufacture of biogas
- j) Manufacture of detergents

Basis of assessment

- Raw materials
- Process of production
 - × Vessel, **V**
 - × Chemical process, **Cp**
 - × Conversion to desired product, **Cd**
 - × Coherence, **Ch**
 - × Purification, **Pr**
- Side effects of the process and their mitigation
- Social benefits

BASIS OF ASSESSMENT		CRITERIA OF ASSESSMENT	SCORE
A	Raw materials Rm	All raw materials	02
		Any one raw material	01
		No raw material	00
B	Process of production Pp	Process of production with all V, Cp, Ch, Pr	03
		Process of production with any three of V, Cp, Ch, Pr	02
		Process of production with any one of V, Cp, Ch, Pr	01
		No process of production	00
C	Side effects of the process of production and mitigation Se	Any one danger identified, explained and mitigated	03
		Any one danger identified and explained OR identified and mitigated OR explained and mitigated	02
		Any one danger identified OR explained OR mitigated	01
		No danger identified, explained or mitigated	00
D	Social benefits Sb	Any one social benefit identified, effect of the benefit and impact of the benefit	03
		Any one social benefit identified and effect of the benefit OR identified and impact of the benefit OR effect of the benefit and impact of the benefit	02
		Any one social benefit identified OR effect of the benefit OR impact of the benefit	01
		No social benefit identified	00

2nd The learner appreciates the application of chemistry in daily life

- a) Food additives such as flavour enhancers, antioxidants, acidity regulators, bulking agents, food colour (dye), emulsifiers, gelling agents, glazing agents, preservatives, raising agents, sweeteners, thickeners, whitening agents, humectants
- b) Medicines such as traditional (herbal) medicines, analgesics, antibiotics, psychotherapeutics – stimulants, antidepressants, antipsychotics, antipyretics; antimalarials, antiseptics, mood stabiliser such as lithium, anticonvulsants and hormone replacements, stimulants, oral contraceptives, tranquilizers, statins...
- c) Nuclear processes i.e. nuclear fission, nuclear fusion, half-life and radioactive decay
- d) Detergents – soapless and soapy detergents

Basis of assessment

- Category/ type of product
- Function(s) of the product
- Dangers or side effects of the product and mitigation
- Evaluation of the product/ process

BASIS OF ASSESSMENT		CRITERIA OF ASSESSMENT	SCORE
A	Category/type of product	Any one product and category/type of product identified	02
		Any one product or category/type of product identified	01
		no product nor category/type of product identified	00
B	Function(s) of product(s)	Any one function of product(s)	01
		No function of the product(s)	00
C	Dangers or Side effects of the product and mitigation	Any one danger/side effect identified explained and mitigated	03
		Any one danger/side effect identified explained and mitigated	02
		Any one danger/side effect identified and explained OR explained and mitigated	01
		No danger/side effect identified OR mitigated	00
D	Evaluation of products/processes	Evaluation of products/processes basing on both similarities and differences	02
		Evaluation of products/processes basing on either similarities OR differences	01
		No evaluation of products/processes	00

3rd The learner appreciates the diversity and interactions of substances and their importance in life

- Elements, compounds and mixtures
- The periodic table
- Trends in the periodic table
- Structure and bonding
- Mole concept
- Materials classified as synthetic and natural
- Polymers and plastics
- Reactivity series
- Air – rusting and combustion

Basis of assessment

- Category of element/ compound/ substance/ material with a reason
- Properties or prediction of properties of element/ compound/ substance/ material
- Uses of elements/ compound/ substance/ material OR applications OR quantity of matter i.e. moles
- Impact/ pollution of environment by element/ compound/ substance/ material and mitigation

BASIS OF ASSESSMENT		CRITERIA OF ASSESSMENT	SCORE
A	Category of element/ compound/ substance/ material with a reason	Category of element/ compound/ substance/ material identified with a reason and example	03
		Category of element/ compound/ substance/ material identified with either example OR reason	02
		Category of element/ compound/ substance/ material identified OR reason only OR example only	01
		No category of element/ compound/ substance/ material identified OR reason OR example	00
B	Properties or prediction of properties of element/ compound/ substance/ Material	At least four properties or characteristics or predictions of trends	03
		At least two properties or characteristics or predictions of trends	02
		Any one property or characteristic or prediction of trends	01
		No property or characteristic or prediction of trends	00
C	Uses of element/ compound/ substance/ material OR application OR quantity of matter i.e. moles	Any one use/application	01
		No use/ application	00
D	Impact/ pollution of environment by element/ compound/ substance/ material and mitigation	Impact and mitigation identified	02
		Either impact OR mitigation identified	01
		No impact OR mitigation identified	00

4th The learner appreciates the existence of natural resources in the environment and their importance in daily life

- a) Air
- b) Water
- c) Fossil fuels
- d) Rocks and minerals
- e) Carbon-based fuels

Basis of assessment

- Identify category of natural resource, reason and example
- Composition of natural resource
- Impact of the natural resource on the environment, how it occurs and mitigation
- Benefits/ importance of the natural resource

BASIS OF ASSESSMENT		CRITERIA OF ASSESSMENT	SCORE
A	Identity of category of natural resource, reason and example	Category of natural resource identified with a reason and example	03
		Category of natural resource identified with a reason OR category of natural resource identified with example	02
		Category of natural resource identified OR example	01
		No identified category of natural resource	00
B	Composition of natural resource	Any two components of natural resource	02
		Any one component of natural resource	01
		No component of natural resource	00
C	Impact of the natural resource on the environment, how it occurs, and mitigation	Any one impact of the natural resource on the environment, how it occurs, and its mitigation	03
		Any one impact of the natural resource on the environment and how it occurs OR any one Impact of the natural resource on the environment, and its mitigation	02
		Any one impact of the natural resource on the environment OR how it occurs OR its mitigation	01
		No impact of the natural resource on the environment, how it occurs, and its mitigation	00
D	Benefit/importance of natural resource	Any one benefit/importance of natural resource	01
		No benefit/importance of natural resource	00

5th The learner understands that chemistry is a process of evidence-based enquiry involving collection of evidence and the development of theories that help us explain the evidence (science process skills)

- Aim of the experiment
- Variables for the experiment
- Hypothesis
- Procedure of the experiment
- Risks and mitigation
- Presentation of data
- Recording of data
- Data analysis and interpretation
- Conclusion

Assessable areas

- a) Rates of chemical reactions
- b) Energy changes during chemical reactions
- c) Formulae, stoichiometry and mole concept
- d) The reactivity series
- e) Solubility of salts – salt preparation
- f) Soapy detergents and hard water

Basis of assessment	Assessment criteria	Scoring
Aim of the experiment	<ul style="list-style-type: none"> ▪ Aim of experiment with both key words ▪ Aim of experiment with one key word ▪ No aim of the experiment 	02 01 00
Variables of the experiment	<ul style="list-style-type: none"> ▪ Independent, dependent and controlled ▪ Independent and dependent or independent and controlled or dependent and controlled variable ▪ Independent or dependent or controlled variable ▪ No variable 	03 02 01 00
Hypothesis	<ul style="list-style-type: none"> ▪ Hypothesis related to experiment with both key words ▪ Hypothesis related to experiment with one of key words ▪ No / wrong hypothesis of the experiment 	02 01 00
Procedure	<ul style="list-style-type: none"> ▪ Relevant material, relevant procedure, coherent procedure of the experiment ▪ Relevant materials and procedure ▪ Either relevant material or relevant procedure ▪ No relevant material and procedure 	03 02 01 00
Risks and mitigations	<ul style="list-style-type: none"> ▪ Any one risk identified and mitigated ▪ Any one risk identified or mitigated ▪ No risk identified or mitigated 	02 01 00
Presentation of data	<ul style="list-style-type: none"> ▪ 2/3 of required sets of data appropriately presented ▪ 1/3 of required sets of data appropriately presented ▪ Data appropriately presented without required sets ▪ Data partially appropriately presented without required sets ▪ No set of data presented 	04 03 02 01 00

Basis of assessment	Assessment criteria	Scoring
Recording of data	<ul style="list-style-type: none"> ▪ Appropriate recording of data within the error margin ▪ Partial appropriate recording of data within the error margin ▪ Appropriate recording of data outside the error margin ▪ Partial appropriate recording of data outside error margin ▪ No data recorded/ data recorded outside error margin 	04 03 02 01 00
Data analysis and interpretation	Method used is: <ul style="list-style-type: none"> ▪ Appropriate and accurate ▪ Appropriate and partially accurate ▪ Appropriate and inaccurate ▪ Inappropriate and inaccurate 	03 02 01 00
Conclusion	<ul style="list-style-type: none"> ▪ Conclusion based on data interpretation ▪ No conclusion based on data interpretation 	01 00